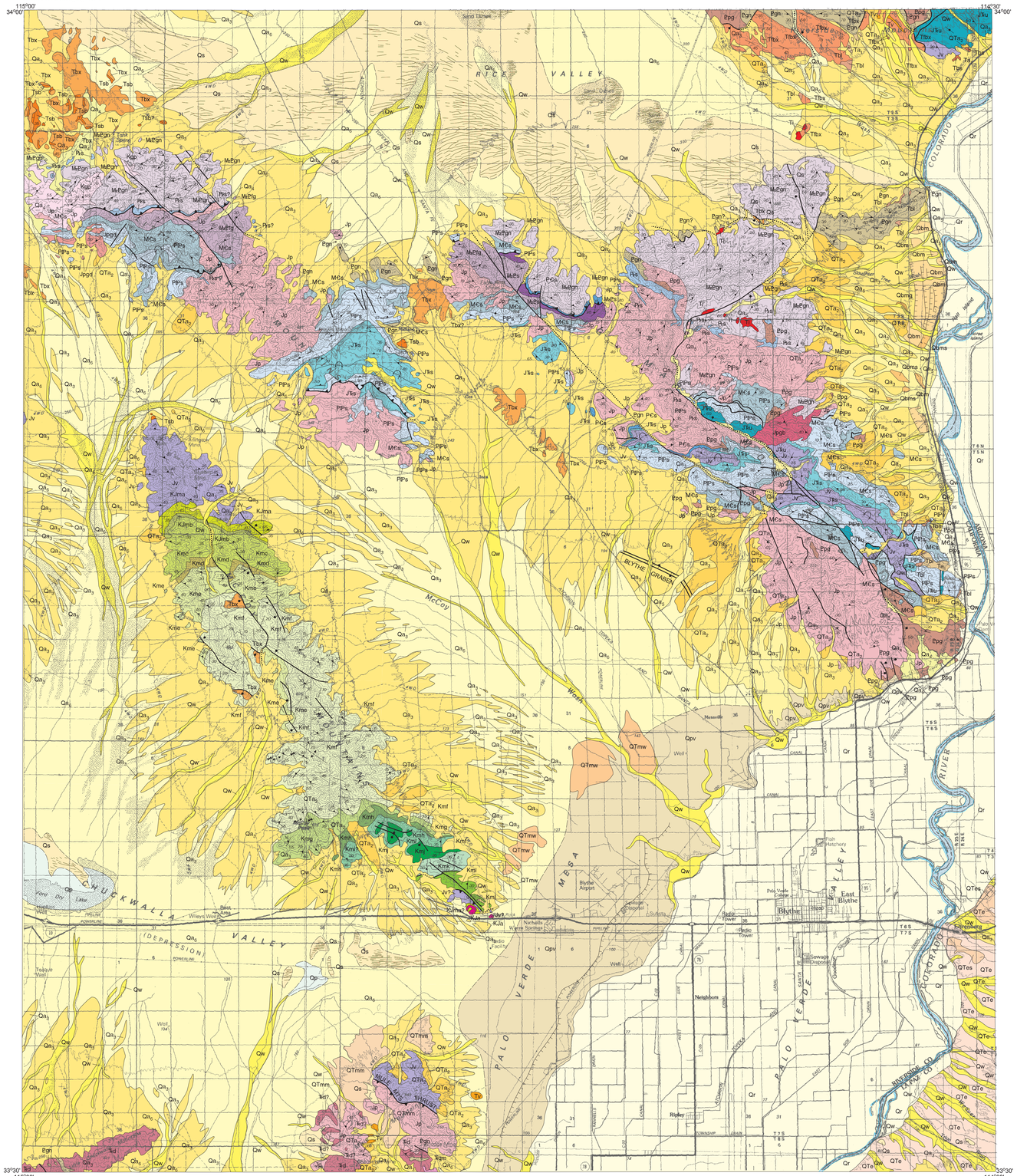
U.S. Department of the Interior
U.S. Geological Survey

Scientific Investigations Map 2922
Pamphlet accompanies map



Base from U.S. Geological Survey, Blythe, 1986.
Universal Transverse Mercator projection

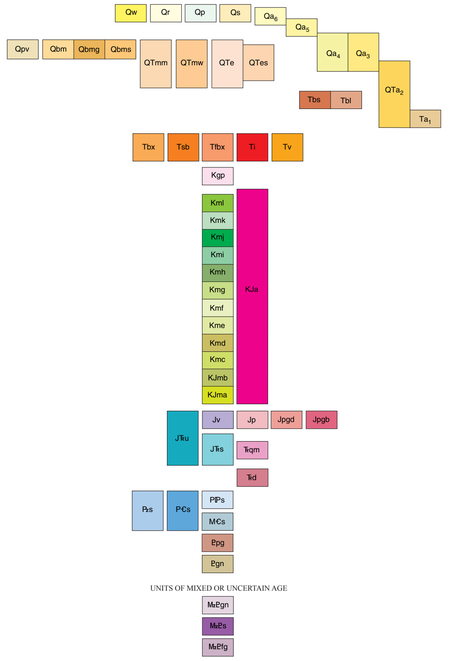
APPROXIMATE MEAN DECLINATION, 2006

SCALE 1:100 000

CONTOUR INTERVAL 50 METERS

Geology compiled in 1988–1990 and 2004
Digital database by Techni Graphic Systems, Inc., and Paul Stone
Edited by Carolyn Donlin
Manuscript approved for publication April 6, 2006

CORRELATION OF MAP UNITS



LIST OF MAP UNITS

[See pamphlet for Description of Map Units]

- Qw — **Alluvium of modern washes (Holocene)**
- Qr — **Alluvium of the modern Colorado River flood plain (Holocene)**
- Qp — **Playa lake deposits (Holocene)**
- Qs — **Eolian sand (Holocene)**—Brown lines mark dune crests

Alluvial-fan and alluvial-valley deposits (Holocene to Miocene)

- Qa_6 — **Unit 6 (Holocene)**
- Qa_5 — **Unit 5 (Holocene)**
- Qa_4 — **Unit 4 (Holocene and Pleistocene)**
- Qa_3 — **Unit 3 (Holocene and Pleistocene)**
- QTa_2 — **Unit 2 (Pleistocene to Miocene)**
- Ta_1 — **Unit 1 (Miocene)**

Alluvial deposits of the ancestral Colorado River (Pleistocene and Pliocene)

- Qpv — **Alluvial deposits of Palo Verde Mesa (Pleistocene)**
- Qbm — **Alluvial deposits east of the Big Maria Mountains (Pleistocene)**
- Qbmg — **Gravel-dominated deposits**
- Qbms — **Sand-dominated deposits**
- QTmm — **Alluvial deposits of the Mule Mountains (Pleistocene or Pliocene)**
- QTmw — **Alluvial deposits of the McCoy Wash area (Pleistocene and/or Pliocene)**
- QTe — **Alluvial deposits of the Ehrenberg area (Pleistocene and/or Pliocene)**
- QTes — **Sand-dominated deposits**

Bouse Formation (Pliocene and/or Miocene)

- Tbs — **Fine-grained clastic sedimentary rocks**
- Tbl — **Limestone**
- Tbx — **Sedimentary breccia (Miocene and Oligocene?)**
- Tsb — **Slide blocks (Miocene and Oligocene?)**
- Tfbx — **Fanglomerate, sedimentary breccia, and slide blocks, undivided (Miocene and Oligocene?)**
- Ti — **Felsic intrusive rocks (Miocene and Oligocene?)**
- Tv — **Volcanic rocks (Miocene and Oligocene?)**
- Kgp — **Gneissic porphyritic granite (Cretaceous)**
- KJa — **Andesite (Cretaceous or Jurassic)**

McCoy Mountains Formation (Cretaceous and Jurassic?)

- Kml — **Member L (Cretaceous)**
- Kmk — **Member K (Cretaceous)**
- Kmj — **Member J (Cretaceous)**
- Kmi — **Member I (Cretaceous)**
- Kmh — **Member H (Cretaceous)**
- Kmg — **Member G (Cretaceous)**
- Kmf — **Member F (Cretaceous)**
- Kme — **Member E (Cretaceous)**
- Kmd — **Member D (Cretaceous)**
- Kmc — **Member C (Cretaceous)**
- KJmb — **Member B (Cretaceous or Jurassic)**
- KJma — **Member A (Cretaceous or Jurassic)**
- JTru — **Volcanic and sedimentary rocks, undivided (Jurassic and Triassic)**
- Jv — **Volcanic rocks (Jurassic)**
- Jp — **Plutonic rocks (Jurassic)**
- Jpgd — **Foliated granodiorite and diorite**
- Jpgb — **Hornblende gabbro**
- JTrs — **Sedimentary rocks (Jurassic and Triassic)**
- Tkqm — **Quartz monzonite and monzodiorite (Triassic)**
- Tkd — **Diorite and gabbro (Triassic?)**
- Pzs — **Sedimentary rocks, undivided (Paleozoic)**
- PCs — **Sedimentary rocks (Permian to Cambrian)**
- PPs — **Sedimentary rocks (Permian and Pennsylvanian)**
- MCs — **Sedimentary rocks (Mississippian to Cambrian)**
- Epg — **Porphyritic granite and augen gneiss (Proterozoic)**
- Egn — **Gneiss and amphibolite (Proterozoic)**

UNITS OF MIXED OR UNCERTAIN AGE

- MzEgn — **Gneissic rocks, undivided (Mesozoic and Proterozoic)**
- MzEs — **Schist (Mesozoic or Proterozoic)**
- MzEfg — **Fine-grained gneiss (Mesozoic or Proterozoic)**

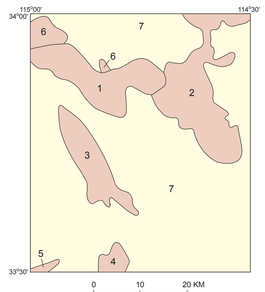
- **Contact**
- **Contact**—Approximately located
- **Fault**—Showing dip where known. Bar and ball on downthrown side. Arrows show apparent sense of lateral displacement. Dotted where concealed
- **Thrust fault**—Teeth on upthrown side
- **Low-angle detachment fault**—Hachures on upper plate. Dotted where concealed
- **Anticline**—Trace of axial surface
- **Syncline**—Trace of axial surface
- **Overturned syncline**—Trace of axial surface
- **Strike and dip of beds**
- **Strike and dip of foliation or cleavage**
- **Inclined**
- **Vertical**
- **Strike and dip of inclined foliation and plunge of lineation**
- **Strike and dip of inclined foliation and horizontal lineation**
- **Strike and dip of beds and intersecting foliation**
- **Strike and dip of beds and intersecting foliation of equal strike and opposing dip**
- **Edge of alluvial terrace**—Hachures point downslope from surface of terrace
- **Crest of sand dune**

MAP UNIT	GEOMORPHIC SURFACE OF BULL (1991)	ESTIMATED AGE (KA)	EPOCH
Qw	Q4b	0	HOLOCENE
Qa_6	Q4a	0.1–2	
Qa_5	Q3c	2–4	
	Q3b	4–8	
Qa_3, Qa_4	Q3a	8–12	
	Q2c	12–70	PLEISTOCENE
	Q2b	70–200	
	Q2a	400–730	
QTa_2	Q1	>1200	

Correlation of units QTa_2, Qa_3–Qa_6, and Qw with alluvial geomorphic surfaces of Bull (1991)

	STONE, 1990; THIS REPORT	PELKA, 1973	HARDING AND CONEY, 1985
McCOY MOUNTAINS FORMATION	Member L	McCoy Mountains Formation, undifferentiated	Conglomerate Mbr. (structurally repeated)
	Member K	Unit 14	Siltstone member
	Member J	Unit 13	
	Member I	Unit 12	
	Member H	Unit 11	
	Member G	Unit 10	
	Member F	Unit 9	
		Unit 8	Sandstone member
		Unit 7	
		Unit 6	Conglomerate member
		Unit 5	
	Member E	Unit 4	Mudstone member
	Member D	Unit 3	Basal sandstone member 2
	Member C	Unit 2	
	Member B	Unit 1	Basal sandstone member 1
	Member A		

Correlation of members A–L of the McCoy Mountains Formation with units of Pelka (1973) and Harding and Coney (1985)



Primary sources of geologic mapping, west half of Blythe 30' by 60' quadrangle, California and Arizona

1. Ballard, 1990 (Bedrock of Little Maria Mountains and northwestern Big Maria Mountains)
2. Hamilton, 1964, 1984; W.B. Hamilton, unpublished mapping of bedrock in Big Maria and Riverside Mountains, 1982
3. Stone and Pelka, 1989 (Bedrock of McCoy Mountains)
4. Tosdal, 1988 (Bedrock of Mule Mountains)
5. R.E. Powell, unpublished mapping of bedrock in Little Chuckwalla Mountains, 1990
6. P. Stone, unpublished mapping of small bedrock areas in the northern Little Maria Mountains, 1990
7. P. Stone, unpublished mapping of surficial deposits, 2004. Blythe Graben mapped by Fugro, Inc. (1975)

Note: 1. A preliminary map of this area was presented by Stone (1990).
2. See accompanying pamphlet for reference information.

Geologic Map of the West Half of the Blythe 30' by 60' Quadrangle, Riverside County, California, and La Paz County, Arizona

Compiled by
Paul Stone

2006